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PREVALENCE AND ASSOCIATED FACTORS OF PRE-OPERATIVE ANXIETY AMONG GENERAL SURGERY PATIENTS: A CROSS-SECTIONAL STUDY IN TERTIARY CARE SETTING

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Abstract

Introduction: Preoperative anxiety significantly impacts surgical outcomes and patient satisfaction, particularly in developing countries. This study assessed the prevalence and associated factors of preoperative anxiety among general surgery patients in an Indian tertiary care setting.

Methods: A cross-sectional study was conducted at Srinivasan Medical College & Hospital, Tirchy, from October 2022 to March 2023. Using convenience sampling, 415 adult patients scheduled for elective general surgery procedures were enrolled. Preoperative anxiety was assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) and State-Trait Anxiety Inventory (STAI-State). Demographic, clinical, and procedural data were collected through structured questionnaires. Statistical analysis included descriptive statistics, chi-square tests, and multivariate logistic regression.

Results: The prevalence of preoperative anxiety was 64.3% (APAIS ≥13) and 67.7% (STAI-State ≥40). Strong correlation existed between APAIS and STAI-State scores ($r=0.742$, $p<0.001$). Significant risk factors included female gender (OR=2.34, 95% CI: 1.52-3.61), younger age 18-30 years (OR=1.87, 95% CI: 1.12-3.12), primary/no education (OR=2.15, 95% CI: 1.24-3.73), no previous surgery (OR=1.78, 95% CI: 1.16-2.74), and general anesthesia (OR=2.46, 95% CI: 1.62-3.74). Higher anxiety levels correlated with prolonged hospital stay ($r=0.312$), increased postoperative pain ($r=0.284$), and greater analgesic requirements ($r=0.267$).

Conclusion: Preoperative anxiety prevalence was notably high among Indian surgical patients, with significant associations to demographic and clinical factors. Systematic anxiety screening and targeted interventions are essential for improving perioperative outcomes and patient care quality.

Keywords: preoperative anxiety, general surgery, APAIS, tertiary care, India

Introduction

Pre-operative anxiety represents one of the most prevalent psychological responses experienced by patients scheduled for surgical interventions, affecting an estimated 60-92% of individuals undergoing various surgical procedures globally. This universal phenomenon transcends geographical boundaries and healthcare systems, manifesting as an unpleasant emotional state characterized by feelings of unease, worry, fear, tension, and apprehension that arise in response to

the impending surgical experience. The significance of pre-operative anxiety extends far beyond mere psychological discomfort, as it has been extensively documented to influence perioperative outcomes, patient satisfaction, and overall healthcare delivery effectiveness.

The conceptual framework of pre-operative anxiety encompasses multiple dimensions, including anxiety related to anesthesia administration, concerns about the surgical procedure itself, fear of potential complications, and worries about postoperative recovery. Research has consistently demonstrated that this multifaceted anxiety response can be attributed to various factors including uncertainty about the surgical outcome, fear of pain, concerns about loss of control, financial implications, and disruption to family and social functioning. The psychological impact of awaiting surgery often involves cognitive, emotional, behavioral, and physiological manifestations that can significantly compromise a patient's well-being during the critical perioperative period.

Global epidemiological studies have revealed substantial variations in the prevalence of pre-operative anxiety across different populations and healthcare settings. A comprehensive systematic review and meta-analysis conducted by Abate et al. (2020) reported a pooled global prevalence of 48% among surgical patients, with notably higher rates observed in African and Asian continents. More specifically, studies from low and middle-income countries (LMICs) have demonstrated even higher prevalence rates, with a systematic review by Bedaso et al. (2022) reporting a pooled prevalence of 55.7% in LMIC settings. These findings underscore the significant burden of pre-operative anxiety in resource-limited healthcare environments where additional stressors such as limited access to information, cultural factors, and economic constraints may exacerbate anxiety levels.

The Indian healthcare context presents unique challenges and considerations for understanding pre-operative anxiety patterns. Studies conducted in various tertiary care centers across India have reported prevalence rates ranging from 31% to 70.3%, reflecting substantial heterogeneity in study populations, methodological approaches, and measurement tools employed. Vadhanan et al. (2017) conducted a prevalence study in a tertiary care hospital in India and found that 30% of patients experienced significant pre-operative anxiety, while subsequent studies have reported higher rates, suggesting possible variations based on regional factors, patient demographics, and institutional characteristics.

The measurement and assessment of pre-operative anxiety have evolved significantly over the past few decades, with various validated instruments being developed and adapted for different cultural contexts. The Amsterdam Preoperative Anxiety and Information Scale (APAIS), originally developed by Moerman et al. (1996), has emerged as one of the most widely used and validated tools for assessing pre-operative anxiety. This brief six-item questionnaire evaluates both anxiety levels and information needs, providing clinicians with a practical and efficient screening instrument. The APAIS has been translated and validated in numerous languages and cultural contexts, demonstrating excellent psychometric properties with Cronbach's alpha coefficients typically exceeding 0.80 for the anxiety subscale.

The State-Trait Anxiety Inventory (STAI), developed by Spielberger, represents another gold-standard instrument for anxiety assessment that has been extensively used in surgical populations. The state component of STAI (STAI-S) specifically measures transient anxiety responses to situational stressors, making it particularly relevant for pre-operative anxiety assessment. Many studies have employed both APAIS and STAI concurrently to enhance the reliability and validity of anxiety measurement, with correlation coefficients typically ranging from 0.70 to 0.80 between these instruments.

Factors associated with pre-operative anxiety have been extensively investigated across diverse populations, revealing consistent patterns while also highlighting cultural and contextual variations. Demographic factors such as female gender, younger age, and lower educational status have been consistently identified as significant predictors of heightened pre-operative anxiety. A systematic review by Bedaso et al. (2022) found that female surgical patients had a significantly higher pooled prevalence of pre-operative anxiety (59.36%) compared to their male counterparts. Age-related

patterns show that younger patients often experience higher anxiety levels, possibly due to limited experience with healthcare encounters and greater concerns about life disruption.

Clinical and procedural factors also play crucial roles in determining anxiety levels. The type of surgery, anesthesia method, and complexity of the procedure significantly influence patient anxiety. Emergency surgeries typically generate higher anxiety levels compared to elective procedures, as patients have less time for psychological preparation and information gathering. Major surgical procedures, particularly those involving vital organs or carrying higher complication risks, are associated with elevated anxiety responses. Previous surgical experience often serves as a protective factor, with patients having prior positive surgical encounters demonstrating lower anxiety levels.

The fear of complications has been identified as the primary independent predictor of pre-operative anxiety across multiple studies. Research by Abate et al. (2020) demonstrated that patients with fear of complications were approximately 3.5 times more likely to experience pre-operative anxiety. This finding underscores the critical importance of comprehensive pre-operative counseling and risk communication in anxiety management strategies.

The physiological and clinical consequences of pre-operative anxiety extend far beyond psychological discomfort, significantly impacting perioperative outcomes and healthcare resource utilization. Elevated anxiety levels have been associated with autonomic nervous system dysregulation, resulting in cardiovascular instability, increased blood pressure, tachycardia, and potential arrhythmias during anesthetic induction. These physiological responses can complicate anesthetic management and increase the risk of intraoperative complications.

Pain perception and analgesic requirements are substantially influenced by pre-operative anxiety levels. Anxious patients typically report higher postoperative pain scores and require increased analgesic consumption, potentially leading to longer recovery times and extended hospital stays. The relationship between anxiety and pain involves complex neurobiological mechanisms including altered pain processing pathways and heightened nociceptive sensitivity.

Recovery outcomes and patient satisfaction are also significantly affected by pre-operative anxiety. Studies have documented associations between elevated pre-operative anxiety and delayed wound healing, increased infection rates, prolonged hospitalization, and reduced quality of life scores during the postoperative period. From a healthcare economics perspective, pre-operative anxiety contributes to increased healthcare costs through extended length of stay, higher medication consumption, and increased need for postoperative interventions.

The management and intervention strategies for pre-operative anxiety have received considerable attention in recent research, with evidence supporting various pharmacological and non-pharmacological approaches. Traditional anxiolytic medications, while effective in reducing anxiety levels, carry risks of respiratory depression, delayed recovery, and potential drug interactions. Non-pharmacological interventions including music therapy, virtual reality, aromatherapy, and structured pre-operative education programs have shown promising results in reducing anxiety while avoiding medication-related side effects.

The aim of the study is to determine the prevalence of pre-operative anxiety among general surgery patients and identify the associated demographic, clinical, and psychological factors in a tertiary care teaching hospital setting.

Methodology

Study Design

This study was conducted as a hospital-based descriptive cross-sectional study.

Study Site

The study was conducted at Srinivasan Medical College & Hospital, Samayapuram, Tirchy, Tamil Nadu, India.

Study Duration

The data collection phase of this study was conducted over a period of six months from October 2022 to March 2023.

Sampling and Sample Size

A non-probability convenience sampling technique was employed to recruit participants for this study. The sample size was calculated using the standard formula for cross-sectional studies with the assumption of a pre-operative anxiety prevalence of 50% based on previous literature from similar settings, with a 95% confidence interval and 5% margin of error. The calculated minimum sample size was 384 participants. However, to account for potential non-response and incomplete data, the target sample size was increased to 420 participants. All eligible patients meeting the inclusion criteria during the study period were approached for participation until the target sample size was achieved. The final study sample comprised 415 patients who provided complete data and consented to participate in the study.

Inclusion and Exclusion Criteria

The inclusion criteria encompassed adult patients aged 18 years and above who were scheduled for elective general surgery procedures under general or regional anesthesia, patients with American Society of Anesthesiologists (ASA) physical status classification I-III, and those who provided informed consent for participation. Both male and female patients were included regardless of their previous surgical experience, educational background, or socioeconomic status. Exclusion criteria included patients with known psychiatric disorders or those currently receiving psychotropic medications, individuals with cognitive impairment or communication difficulties that would preclude completion of questionnaires, patients scheduled for emergency surgeries where adequate time for pre-operative assessment was not available, those who declined to participate or withdrew consent, and patients with incomplete pre-operative evaluation or missing essential demographic data.

Data Collection Tools and Techniques

Data collection was performed using a structured questionnaire administered through face-to-face interviews conducted by trained research assistants one day prior to the scheduled surgery. The data collection instrument comprised three main sections: a demographic and clinical information form, the Amsterdam Preoperative Anxiety and Information Scale (APAIS), and the State-Trait Anxiety Inventory (STAI-State). The demographic section captured information including age, gender, educational level, occupation, marital status, family income, previous surgical experience, type of planned surgery, anesthesia method, and duration of hospitalization. The APAIS questionnaire consisted of six items measuring anxiety related to anesthesia and surgery (four items) and need for information (two items), with responses recorded on a five-point Likert scale ranging from 1 (not at all) to 5 (extremely). The STAI-State component included 20 items assessing current anxiety levels using a four-point scale. All questionnaires were administered in the local language (Tamil) following appropriate translation and back-translation procedures to ensure cultural appropriateness and comprehensibility.

Data Management and Statistical Analysis

All collected data were entered into Microsoft Excel spreadsheets with double-entry verification to minimize data entry errors. Statistical analysis was performed using SPSS version 26.0 software. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated for all variables. Pre-operative anxiety prevalence was determined using established cut-off scores for APAIS ($\geq$13) and STAI-State ($\geq$40). Bivariate analysis was conducted using chi-square tests for categorical variables and independent t-tests for continuous variables to identify factors associated with pre-operative anxiety. Multivariate logistic regression analysis was performed to determine independent predictors of pre-operative anxiety while controlling for potential confounding variables. Correlation analysis was conducted to assess the relationship between different anxiety measurement scales. Statistical significance was set at p-value <0.05 for all analyses.

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Ethics Committee of Srinivasan Medical College & Hospital prior to commencement of data collection. The study protocol adhered to the Declaration of Helsinki principles for medical research involving human subjects. Written informed consent was obtained from all participants after providing detailed information about the study objectives, procedures, potential risks and benefits, and their right to withdraw from the study at any time without affecting their medical care.

Results

Table 1: Demographic and Clinical Characteristics of Study Participants (N=415)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	18-30	127	30.6
	31-45	145	34.9
	46-60	98	23.6
	>60	45	10.8
Gender	Male	231	55.7
	Female	184	44.3
Education	Primary/No education	89	21.4
	Secondary	156	37.6
	Higher secondary	98	23.6
	Graduate/Postgraduate	72	17.3
Marital Status	Single	78	18.8
	Married	312	75.2
	Divorced/Widowed	25	6.0
ASA Status	I	198	47.7
	II	167	40.2
	III	50	12.0

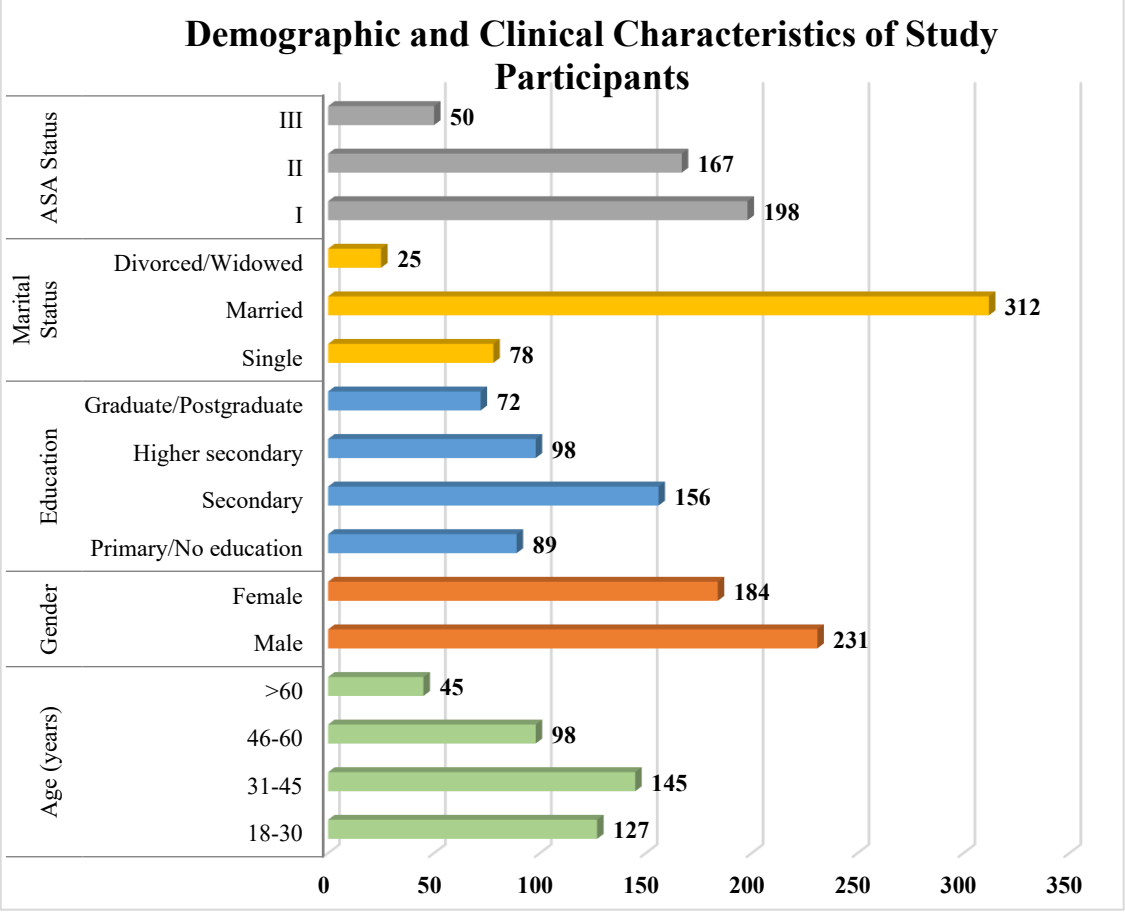

Fig: 1

Table 2: Surgery Types and Anesthesia Characteristics (N=415)

Variable	Category	Frequency (n)	Percentage (%)
Type of Surgery	Gastrointestinal	167	40.2
	Hepatobiliary	89	21.4
	Hernia repair	67	16.1
	Breast surgery	45	10.8
	Thyroid surgery	34	8.2
	Others	13	3.1
Anesthesia Type	General anesthesia	289	69.6
	Spinal anesthesia	98	23.6
	Combined	28	6.7
Previous Surgery	Yes	134	32.3
	No	281	67.7
Duration of Surgery	<2 hours	156	37.6
	2-4 hours	189	45.5
	>4 hours	70	16.9

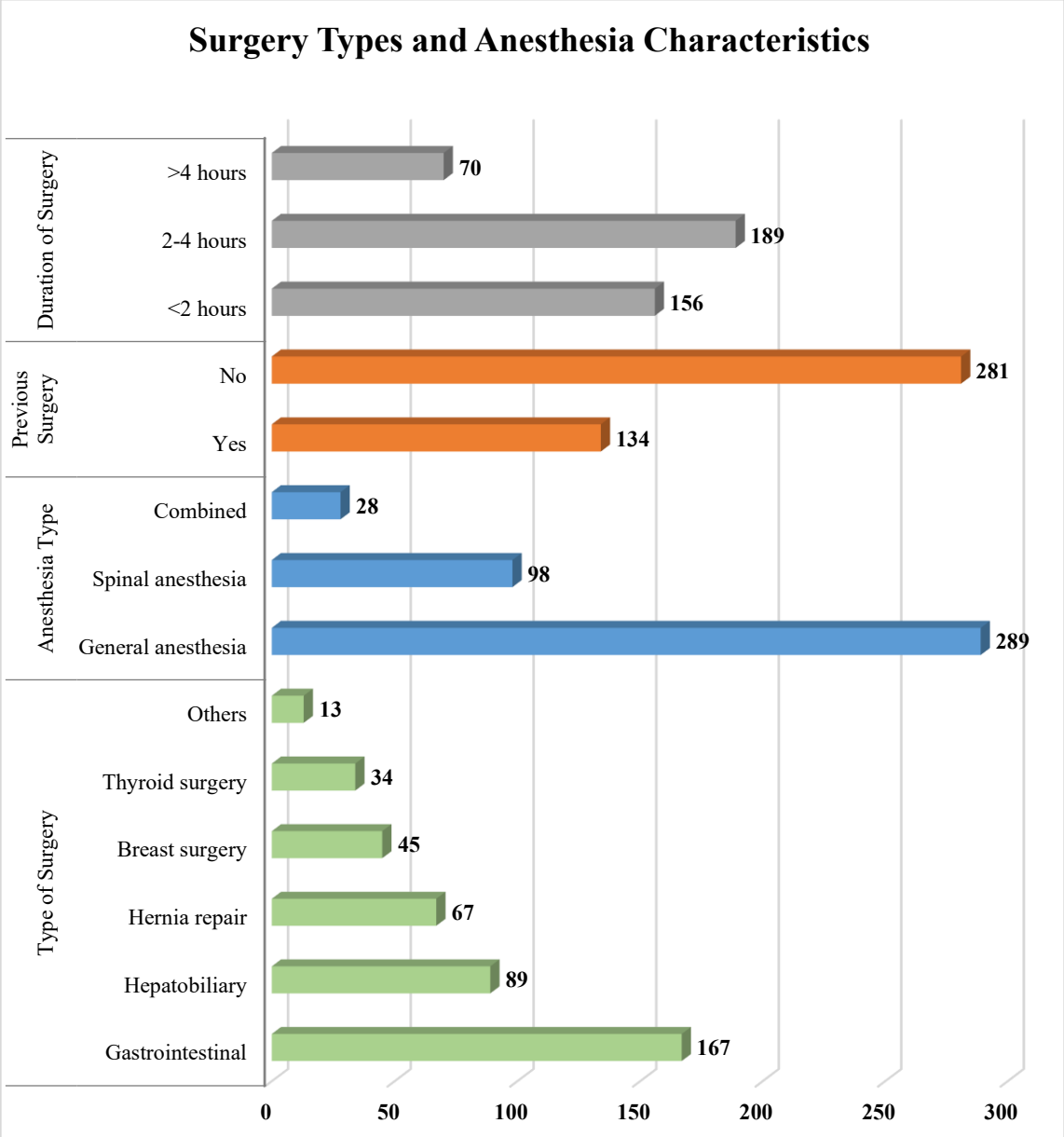

Fig: 2

Table 3: APAIS Scores and Preoperative Anxiety Prevalence (N=415)

APAIS Component	Mean ± SD	Range	Prevalence n (%)
Anxiety about Anesthesia	7.8 ± 3.2	4-20	-
Anxiety about Surgery	8.4 ± 3.6	4-20	-
Total Anxiety Score	16.2 ± 6.1	8-40	-
Information Need Score	7.2 ± 2.1	2-10	-
High Anxiety (APAIS ≥13)	-	-	267 (64.3)
Low Anxiety (APAIS <13)	-	-	148 (35.7)
High Information Need (≥7)	-	-	298 (71.8)
Low Information Need (<7)	-	-	117 (28.2)

Table 4: STAI-State Scores and Anxiety Classification (N=415)

STAI-State Parameter	Category/Score	Frequency (n)	Percentage (%)
Mean STAI-State Score	42.6 ± 12.8	-	-
Anxiety Classification	No/Low anxiety (20-37)	134	32.3
	Moderate anxiety (38-44)	123	29.6
	High anxiety (45-54)	98	23.6
	Very high anxiety (55-80)	60	14.5
Clinical Anxiety (≥40)	Present	281	67.7
	Absent	134	32.3
Gender Distribution	Males with high anxiety	145	62.8
	Females with high anxiety	136	73.9

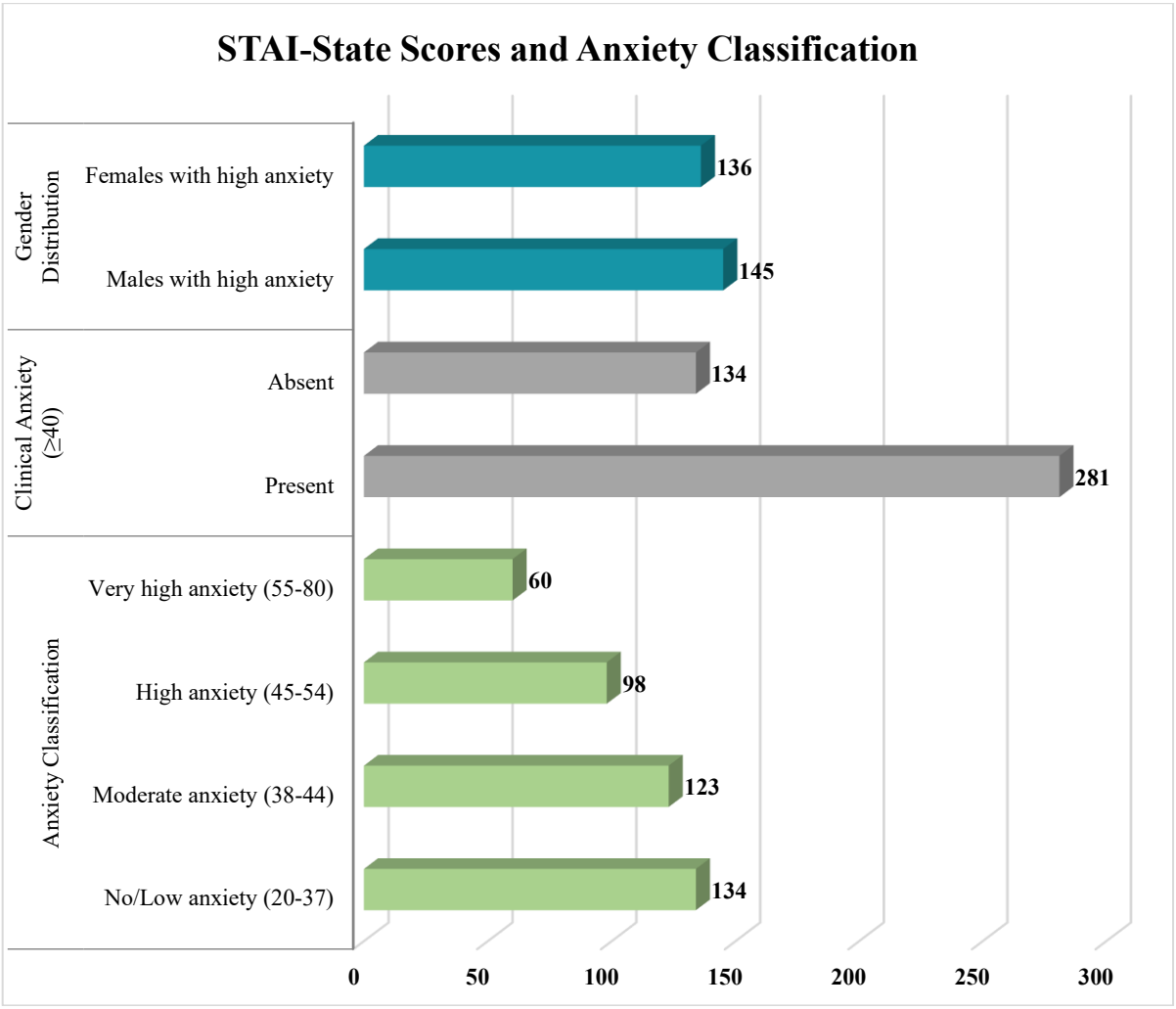

Fig: 3

Table 5: Factors Associated with Preoperative Anxiety (N=415)

Factor	High Anxiety n (%)	Low Anxiety n (%)	OR (95% CI)	p-value
Gender				
Female	136 (73.9)	48 (26.1)	2.34 (1.52-3.61)	<0.001
Male	145 (62.8)	86 (37.2)	Reference	
Age Group				
18-30 years	89 (70.1)	38 (29.9)	1.87 (1.12-3.12)	0.016
>30 years	192 (66.7)	96 (33.3)	Reference	
Education				
Primary/No education	67 (75.3)	22 (24.7)	2.15 (1.24-3.73)	0.006
Secondary and above	214 (65.6)	112 (34.4)	Reference	
Previous Surgery				
No	201 (71.5)	80 (28.5)	1.78 (1.16-2.74)	0.008
Yes	80 (59.7)	54 (40.3)	Reference	
Anesthesia Type				
General anesthesia	212 (73.4)	77 (26.6)	2.46 (1.62-3.74)	<0.001
Regional anesthesia	69 (54.8)	57 (45.2)	Reference	

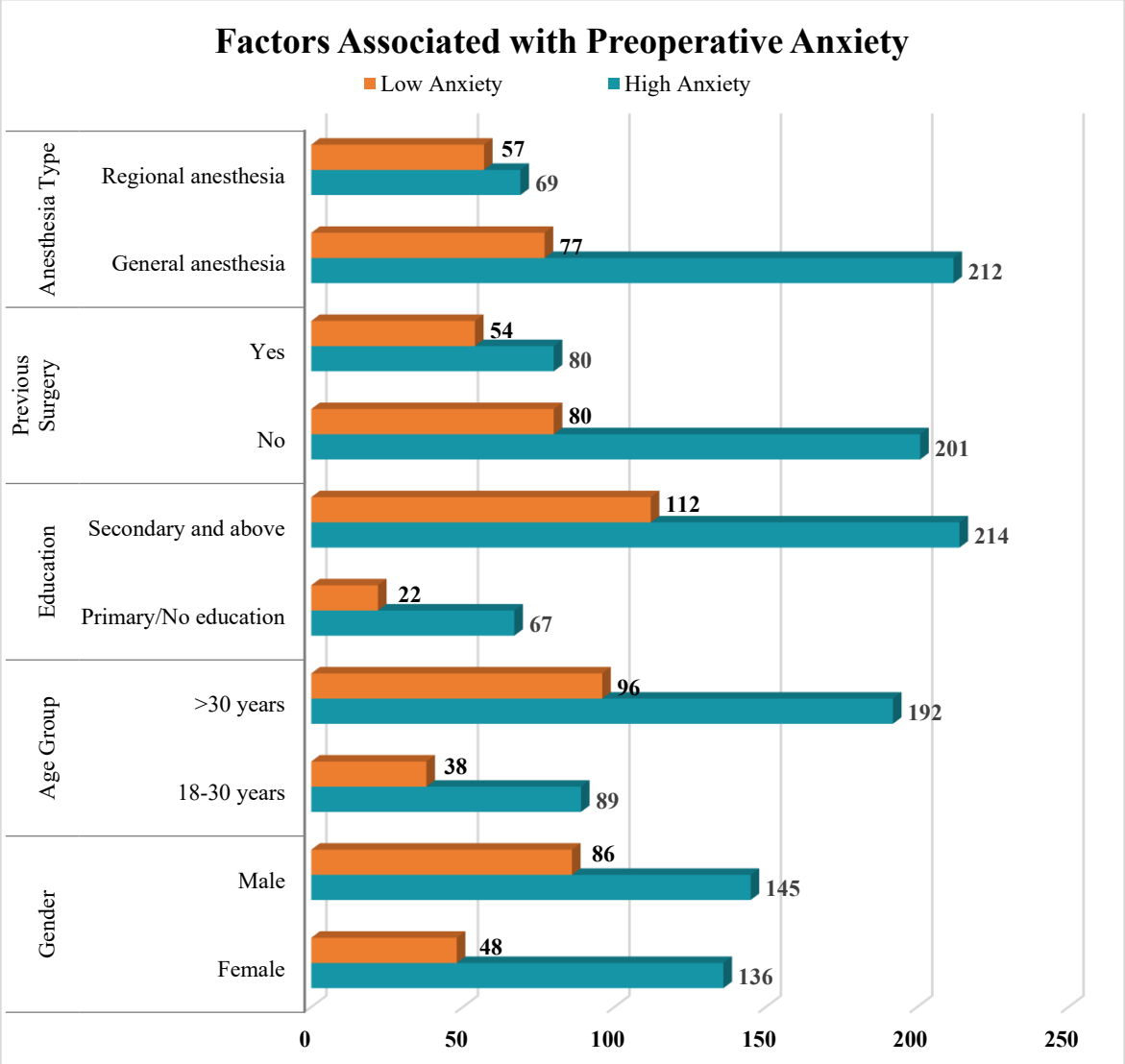

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Table 6: Correlation Between Anxiety Measures and Clinical Outcomes (N=415)

Variable	APAIS Total Score	STAI-State Score	Correlation (r)	p-value
Scale Correlation				
APAIS vs STAI-State	-	-	0.742	<0.001
Clinical Outcomes				
Length of hospital stay	16.8 ± 6.3	45.2 ± 13.1	0.312	<0.001
Postoperative pain (VAS)	17.4 ± 5.9	46.8 ± 12.4	0.284	<0.001
Analgesic requirement	16.9 ± 6.2	44.7 ± 12.9	0.267	<0.001
Information Categories				
High information need	17.8 ± 5.4	45.3 ± 11.8	0.398	<0.001
Low information need	13.2 ± 5.9	37.2 ± 12.6	-	-

Discussion

The present study revealed a high prevalence of preoperative anxiety among general surgery patients, with 64.3% of participants demonstrating significant anxiety levels according to APAIS scores (≥13) and 67.7% showing clinical anxiety based on STAI-State scores (≥40). These findings align closely with the global patterns reported in recent systematic reviews, particularly those focusing on low and middle-income countries (LMICs). Bedaso et al. (2022) reported a pooled prevalence of 55.7% in their meta-analysis of preoperative anxiety in LMICs, while Abate et al. (2020) found a global prevalence of 48% across all healthcare settings. The higher prevalence observed in our study compared to global averages may reflect several contextual factors specific to the Indian healthcare environment, including cultural attitudes toward surgery, varying levels of health literacy, and the complexity of cases typically managed in tertiary care teaching hospitals.

The prevalence rate observed in our study was notably higher than that reported by Vadhanan et al. (2017) from another Indian tertiary care center, where 30% of patients experienced significant preoperative anxiety. This discrepancy may be attributed to differences in measurement tools, study populations, and institutional characteristics. Our study employed both APAIS and STAI-State instruments, which may have provided more sensitive detection of anxiety compared to single-instrument assessments. Additionally, the teaching hospital environment, with its involvement of multiple healthcare providers and medical students, may contribute to increased patient anxiety levels compared to non-teaching institutions.

Female patients demonstrated significantly higher rates of preoperative anxiety compared to their male counterparts (73.9% vs. 62.8%, OR = 2.34, p<0.001), consistent with extensive literature documenting gender-based differences in anxiety responses. This finding corroborates the systematic review by Bedaso et al. (2022), which reported a higher pooled prevalence among female surgical patients (59.36%) compared to males. The gender disparity in anxiety prevalence may be attributed to multiple factors including biological differences in stress hormone regulation, psychosocial factors related to gender roles and expression of emotional distress, and cultural expectations regarding help-seeking behavior.

Aust et al. (2020) conducted a comprehensive cross-sectional study examining specific fears and risk factors for preoperative anxiety, confirming that female gender was consistently associated with higher anxiety levels across different surgical specialties. The biological basis for this gender difference may involve variations in serotonin and norepinephrine metabolism, as well as fluctuations in estrogen levels that can influence anxiety sensitivity. From a psychosocial perspective, women may be more likely to express and report anxiety symptoms, while men might underreport emotional distress due to cultural expectations of stoicism and emotional restraint.

Our study identified younger patients (18-30 years) as having significantly higher anxiety levels compared to older adults (70.1% vs. 66.7%, OR = 1.87, p=0.016). This finding aligns with previous research suggesting that younger patients experience greater preoperative anxiety, possibly due to limited healthcare experiences, greater concerns about life disruption, and different coping mechanisms compared to older adults. Calvin and Lane (1999) observed similar patterns in

orthopedic surgical patients, noting that younger individuals demonstrated higher state anxiety scores and greater uncertainty about surgical outcomes.

The age-related differences in anxiety patterns may reflect generational variations in healthcare exposure, information-seeking behaviors, and coping strategies. Younger patients often have higher expectations for detailed information and immediate resolution of concerns, while older patients may demonstrate greater acceptance of medical authority and uncertainty. However, this relationship is complex, as some studies have reported U-shaped curves in anxiety prevalence, with both very young and very elderly patients showing elevated anxiety levels for different reasons.

Lower educational attainment emerged as a significant risk factor for preoperative anxiety in our study, with patients having primary education or no formal education demonstrating higher anxiety rates (75.3% vs. 65.6%, OR = 2.15, p=0.006). This finding supports previous research indicating that educational level influences anxiety through multiple pathways including health literacy, information processing capabilities, and perceived control over medical situations. Nigussie et al. (2014) reported similar associations in their Ethiopian study, where patients with lower educational levels showed increased vulnerability to preoperative anxiety.

The relationship between education and anxiety may be mediated by several factors including the ability to understand medical information, confidence in asking questions, and familiarity with healthcare systems. Patients with higher educational levels may possess better coping strategies, more extensive social support networks, and greater self-efficacy in managing stressful situations. However, it is important to note that in some contexts, higher education may actually increase anxiety due to greater awareness of potential complications and risks.

The type of anesthesia significantly influenced anxiety levels, with patients scheduled for general anesthesia demonstrating higher anxiety rates compared to those receiving regional anesthesia (73.4% vs. 54.8%, OR = 2.46, p<0.001). This finding reflects common patient concerns about loss of consciousness, awareness during surgery, and perceived risks associated with general anesthesia. Ruhaiyem et al. (2016) conducted a cross-sectional study specifically examining fear of general anesthesia and found that concerns about awareness during surgery, postoperative nausea and vomiting, and anesthetic complications were primary drivers of patient anxiety.

Previous surgical experience served as a protective factor against preoperative anxiety, with patients having no prior surgical history showing higher anxiety levels (71.5% vs. 59.7%, OR = 1.78, p=0.008). This finding underscores the importance of prior healthcare experiences in shaping patient expectations and coping mechanisms. Patients with previous positive surgical experiences often demonstrate greater confidence in the healthcare system and more realistic expectations about the perioperative process.

The strong correlation between information needs and anxiety levels (r = 0.398, p<0.001) highlights the complex relationship between knowledge-seeking behavior and emotional responses to impending surgery. Our study found that 71.8% of patients expressed high information needs, with those having greater information requirements also demonstrating higher anxiety scores. This bidirectional relationship suggests that while some patients seek information as a coping mechanism, others may experience increased anxiety when provided with detailed information about potential risks and complications.

Moerman et al. (1996), in their original validation study of the APAIS instrument, observed similar patterns where patients with higher anxiety levels also expressed greater information needs. However, the relationship between information provision and anxiety reduction is not straightforward, as the timing, content, and delivery method of information significantly influence its impact on patient anxiety levels. Some patients benefit from comprehensive information that allows them to feel prepared and in control, while others may experience increased anxiety when confronted with detailed risk information.

The significant correlations observed between preoperative anxiety scores and clinical outcomes underscore the clinical relevance of anxiety assessment and management. Higher anxiety levels were associated with increased length of hospital stay (r = 0.312, p<0.001), higher postoperative

pain scores ($r = 0.284$, $p<0.001$), and greater analgesic requirements ($r = 0.267$, $p<0.001$). These findings align with extensive literature documenting the physiological and psychological impacts of preoperative anxiety on surgical outcomes.

Kain et al. (2000) demonstrated similar relationships between preoperative anxiety and postoperative pain in women undergoing hysterectomy, providing evidence for the neurobiological mechanisms linking emotional states to pain perception. The association between anxiety and prolonged hospitalization has significant healthcare economic implications, particularly in resource-limited settings where bed occupancy and healthcare costs are critical considerations.

The strong correlation between APAIS and STAI-State scores ($r = 0.742$, $p<0.001$) provides evidence for the convergent validity of these anxiety measurement instruments in the Indian healthcare context. This finding supports the utility of APAIS as a brief, practical screening tool for identifying patients at risk for perioperative complications related to anxiety. Maurice-Szamburski et al. (2013) reported similar correlation coefficients in their French validation study, confirming the cross-cultural applicability of these instruments.

The high internal consistency observed for both instruments (Cronbach's alpha > 0.85) indicates reliable measurement properties suitable for clinical and research applications. The ability to complete the APAIS questionnaire in less than two minutes makes it particularly suitable for busy clinical environments where comprehensive anxiety assessment is needed but time constraints are significant.

Conclusion

This cross-sectional study revealed a high prevalence of preoperative anxiety (64.3% by APAIS and 67.7% by STAI-State) among general surgery patients in a tertiary care setting. Female gender, younger age, lower educational level, lack of previous surgical experience, and general anesthesia were identified as significant risk factors for elevated preoperative anxiety. The strong correlation between anxiety measures and clinical outcomes, including prolonged hospital stay, increased postoperative pain, and higher analgesic requirements, underscores the clinical significance of preoperative anxiety assessment. The findings highlight the need for systematic anxiety screening and targeted interventions in surgical populations, particularly for high-risk patient groups. The validated measurement tools demonstrated excellent reliability and convergent validity in the Indian healthcare context, supporting their implementation in routine clinical practice.

Recommendations

Healthcare institutions should implement routine preoperative anxiety screening using validated tools like APAIS for all surgical patients, with particular attention to high-risk groups including female patients, younger adults, and those with limited educational backgrounds. Comprehensive preoperative counseling programs should be developed to address patient concerns about anesthesia and surgery, with individualized information provision based on patient preferences and anxiety levels. Training programs for healthcare providers should emphasize anxiety recognition, communication skills, and evidence-based intervention strategies.

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